

The Four Pillars of an Effective IRR Management Program



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The Four Pillars of an Effective IRR Management Program

Dave Wicklund

- **Director of ALM Advisory Services (6+ years)**
 - Specialize in institution-specific assumption development
 - Oversee all Plansmith outsourcing
 - Lead ALCO & Board meetings
 - Represent clients in regulatory matters
 - Provide training for regulatory agencies, financial institutions, & trade groups
- **FDIC Senior Bank Examiner (20+ years)**
 - Capital Markets Subject Matter Expert & ALM Specialist
 - Examiner-in-Charge of 75+ examinations & visits
 - Developed nation-wide IRR training materials
 - Authored articles on IRR, Independent Review Requirements, & Liquidity Risk Management

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The Four Pillars of an Effective IRR Management Program

Plansmith

- 40+ Years in Business
- Schaumburg, Illinois (Chicago Suburb)
- 1200+ Financial Institution Clients
- ALM, Budgeting/Forecasting, Peer Analysis, & Strategic Planning
- Educational & Advisory Services

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Plansmith Products & Services

- **BankersGPS**
 - Call Report Data – Updated Quarterly
 - Web-Based System (can be outsourced)
- **Financial Compass**
 - Instrument-level Inputs
 - Monthly Updates
 - Client-Hosted Software (can be outsourced)
- **Budget Compass**
- **Educational and Advisory Services**

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The Four Pillars of an Effective IRR Management Program

The Four Pillars

- Corporate Governance Structure
- IRR Measurements
- IRR Model Assumptions
- Independent Review Process

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IRR Defined

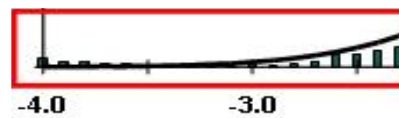
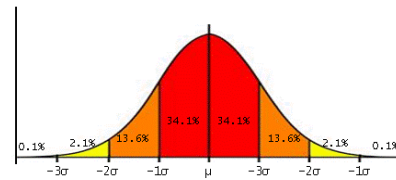
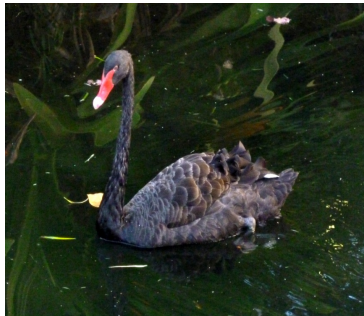
Interest Rate Risk is the risk that **CHANGING** interest rates adversely impact both short-term **EARNINGS** and the institution's longer-term **CAPITAL POSITION**.

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Black Swans and Fat Tails

Risk Management-Low Probability/High Impact Events



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The Four Pillars

- **Corporate Governance Structure**
- IRR Measurements and Modeling
- IRR Model Assumptions
- Independent Review Process

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Corporate Governance Structure

- Board and Management Oversight
- IRR Policies and Limits
- Internal Controls

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Corporate Governance Structure

Board and Management Oversight

- Board
 - Strategy, Policy, and Limits
 - Review Model Results (at least quarterly)
 - Review Assumptions, Scenarios, and Indep. Rev. Findings (annually)
- Asset/Liability Management Committee (ALCO)
- Senior Management
 - Implement Strategy
 - Run Model and Administer Program
 - Report Findings to Board

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Corporate Governance Structure

Policies and Risk Limits

- Responsibilities
- Establish Parameters
 - Earnings Simulations (12- and 24-month)
 - Capital Valuation (NEV)
 - Non-parallel Yield Curve Risk
- Reporting Requirements
- Independent Review (audit)
- Policy Exception Procedures

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Corporate Governance Structure

Internal Controls

- Model Controls
- Reporting Procedures
- Policy Exceptions
- Independent Review

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The Four Pillars

- ✓ Corporate Governance Structure
- **IRR Measurements**
- IRR Model Assumptions
- Independent Review Process

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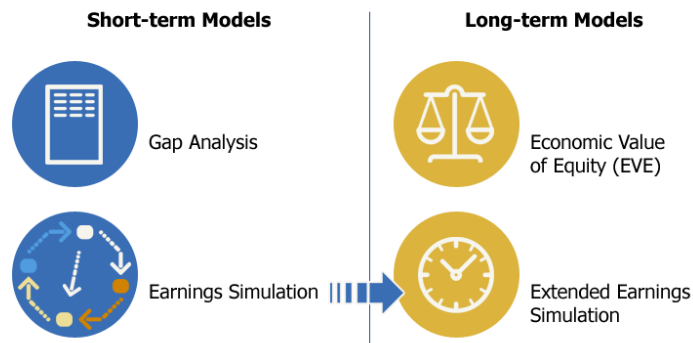
IRR Measurements

- Earnings Simulations
- Capital Valuation (NEV)
- Non-Parallel Shifts in the Yield Curve
- Model Sensitivity Testing

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IRR Measurements/Models



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IRR Models – Earnings Simulation - NII

| Rate Change Immediate | -400bp | -300bp | -200bp | -100bp | Current | +100bp | +200bp | +300bp | +400bp |
|------------------------------|-----------------|-----------------|----------------|----------------|--------------|--------------|---------------|---------------|---------------|
| Int. Income | | | | | | | | | |
| FFS, Repos & Bank CD | 39 | 39 | 39 | 39 | 63 | 161 | 259 | 357 | 454 |
| Loans | 4,015 | 4,430 | 4,845 | 5,260 | 5,675 | 6,057 | 6,401 | 6,733 | 7,085 |
| Securities (Tax Eqv.) | 909 | 910 | 912 | 915 | 932 | 955 | 978 | 1,001 | 995 |
| Total Interest Income | 4,963 | 5,379 | 5,796 | 6,214 | 6,669 | 7,173 | 7,638 | 8,090 | 8,534 |
| Int. Expense | | | | | | | | | |
| Deposits | 296 | 296 | 296 | 345 | 711 | 885 | 1,058 | 1,231 | 1,405 |
| Fed Funds & Borrowing | 16 | 16 | 17 | 21 | 25 | 29 | 32 | 36 | 40 |
| Other Int. Brgs. Bals | | | | | | | | | |
| Total Costs of Funds | 312 | 312 | 313 | 366 | 736 | 914 | 1,090 | 1,267 | 1,445 |
| Net Interest Income | 4,652 | 5,068 | 5,483 | 5,848 | 5,933 | 6,259 | 6,548 | 6,823 | 7,090 |
| Actual Dollar Risk | (1,281) | (866) | (450) | (85) | | 326 | 615 | 890 | 1,157 |
| Percent of Risk | (21.60)% | (14.59)% | (7.58)% | (1.43)% | | 5.49% | 10.36% | 15.00% | 19.49% |
| Percent of Avg. Assets | (0.75)% | (0.51)% | (0.26)% | (0.05)% | | 0.19% | 0.36% | 0.52% | 0.68% |

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IRR Models – Earnings Simulation - NI

| | -200 | -150 | -100 | -50 | 0 | 100 | 200 | 300 | 400 |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Net Interest Income | 75,008,684 | 76,103,584 | 76,247,197 | 77,973,579 | 79,843,247 | 81,191,765 | 85,076,885 | 89,022,676 | 93,003,582 |
| Loan Loss Provision | 525,000 | 525,000 | 525,000 | 525,000 | 525,000 | 525,000 | 525,000 | 525,000 | 525,000 |
| Net Interest Income After Provision | 74,483,684 | 75,578,584 | 75,722,197 | 77,448,579 | 79,318,247 | 80,666,765 | 84,551,885 | 88,497,676 | 92,478,582 |
| Non-Interest Income | 31,666,368 | 31,666,368 | 31,666,368 | 31,666,368 | 31,666,368 | 31,666,368 | 31,666,368 | 31,666,368 | 31,666,368 |
| Non-Interest Expense | 79,977,902 | 79,977,902 | 79,977,902 | 79,977,902 | 79,977,902 | 79,977,902 | 79,977,902 | 79,977,902 | 79,977,902 |
| Operating Income | 26,172,150 | 27,267,050 | 27,410,663 | 29,137,045 | 31,006,713 | 32,355,231 | 36,240,351 | 40,186,142 | 44,167,048 |
| Federal Tax | 8,375,405 | 8,725,786 | 8,771,744 | 9,324,207 | 9,922,523 | 10,354,065 | 11,597,351 | 12,860,052 | 14,133,990 |
| State Tax | 1,342,120 | 1,398,267 | 1,405,631 | 1,494,161 | 1,590,038 | 1,659,191 | 1,858,422 | 2,060,764 | 2,264,906 |
| Net Income | 16,454,626 | 17,142,997 | 17,233,288 | 18,318,677 | 19,494,151 | 20,341,974 | 22,784,578 | 25,265,327 | 27,768,152 |
| Earnings Change | (3,039,526) | (2,351,154) | (2,260,864) | (1,175,475) | 0 | 847,823 | 3,290,427 | 5,771,175 | 8,274,000 |
| Percentage Change | -15.59% | -12.06% | -11.60% | -6.03% | 0.00% | 4.35% | 16.88% | 29.60% | 42.44% |

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IRR Models – Capital Valuation (NEV)

| Rate Shocks | -400bp | -300bp | -200bp | -100bp | Current | +100bp | +200bp | +300bp | +400bp |
|----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| FFS & Other | 60,530 | 58,935 | 57,340 | 55,744 | 54,149 | 52,554 | 50,958 | 49,363 | 47,768 |
| Loans | 215,594 | 213,114 | 203,274 | 194,257 | 186,069 | 178,238 | 170,792 | 163,878 | 157,625 |
| Loan Loss Reserve | (7,666) | (7,666) | (7,666) | (7,666) | (7,666) | (7,666) | (7,666) | (7,666) | (7,666) |
| Securities (Fair Value) | 22,240 | 22,138 | 22,035 | 21,933 | 21,830 | 21,727 | 20,454 | 19,765 | 19,077 |
| Non-Earning Assets | 13,371 | 13,371 | 13,371 | 13,371 | 13,371 | 13,371 | 13,371 | 13,371 | 13,371 |
| Assets (EV) | 304,070 | 299,892 | 288,354 | 277,639 | 267,753 | 258,224 | 247,909 | 238,711 | 230,175 |
| Non-Int Bearing Chkg | 10,275 | 9,908 | 9,541 | 9,175 | 8,808 | 8,441 | 8,074 | 7,707 | 7,340 |
| Int Bearing Chkg | 21,602 | 20,695 | 19,789 | 18,883 | 17,976 | 17,070 | 16,164 | 15,257 | 14,351 |
| MMDA | 29,060 | 27,841 | 26,621 | 25,402 | 24,183 | 22,964 | 21,745 | 20,525 | 19,306 |
| Savings | 94,465 | 91,062 | 87,660 | 84,257 | 80,855 | 77,452 | 74,049 | 70,647 | 67,244 |
| CDs | 54,047 | 53,664 | 53,282 | 52,899 | 52,516 | 52,236 | 51,955 | 51,675 | 51,394 |
| FFP and Repos | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Borrowings | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Non - Paying Liabs | 1,028 | 1,028 | 1,028 | 1,028 | 1,028 | 1,028 | 1,028 | 1,028 | 1,028 |
| Liabilities (EV) | 210,477 | 204,199 | 197,921 | 191,644 | 185,366 | 179,190 | 173,014 | 166,839 | 160,663 |
| EV Equity | 93,593 | 95,693 | 90,433 | 85,995 | 82,387 | 79,033 | 74,894 | 71,873 | 69,512 |
| EVE Risk (% Change) | 13.6 % | 16.2 % | 9.8 % | 4.4 % | 0.0 % | (4.1)% | (9.1)% | (12.8)% | (15.6)% |

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IRR Modeling - Scenarios

- Static/No-Growth (NOT Dynamic/Budget)
- Immediate/Shock (NOT Ramp/Gradual Rate Changes)
- Material Stress Levels (parallel up to +/-400 bps)
 - -300/-400 bps???
 - +500 bps???
- 12- AND 24-Month Simulation Periods
- Non-Parallel Changes in Market Rates
 - Meaningful Shifts
 - Earnings Simulation AND Capital Valuation (NEV)

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IRR Modeling - Yield Curve Risk

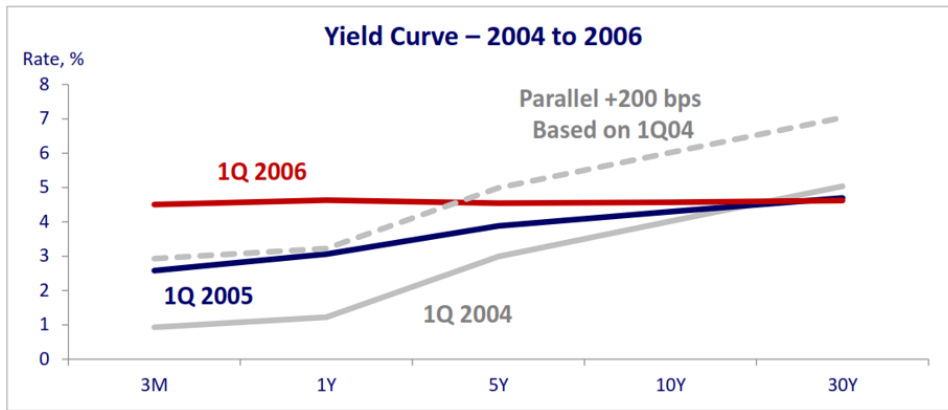
Definition:

The risk arising from changes in the slope and shape of the yield curve, as short-, intermediate-, and long-term interest rates usually move in different ways.

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Yield Curve Risk Modeling

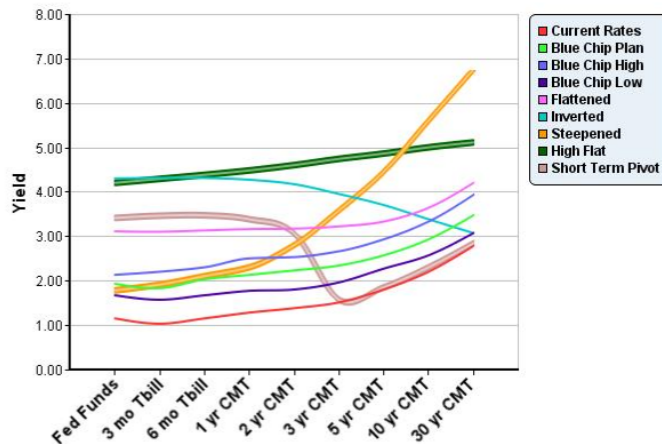


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Source: FDIC Directors' Resource Center – Technical Assistance Video Program "Interest Rate Risk"

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Yield Curve Risk Modeling – Plansmith's Compass



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IRR Models – Sensitivity Testing

- **Stress Test Key Assumptions**
 - **Prepayments**
 - **Deposit/Share Pricing**
 - **Decay Terms**
- **Test Each Independently**

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The Four Pillars

- ✓ **Corporate Governance Structure**
- ✓ **IRR Measurements**
- **IRR Model Assumptions**
- **Independent Review Process**

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Key IRR Model Assumptions

- Prepayments
- Deposit/Share Repricing
- Non-maturity Deposit/Share Decay Rates

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Key IRR Model Assumptions

- Prepayments
 - Loans and Mortgage Backed Securities
 - Dynamic vs. Static
 - Institution Specific

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Key IRR Model Assumptions

- **Deposit/Share Repricing**
 - Consider Historical Data (Full Rate Cycle)
 - Include Qualitative Analysis
 - Rate Environment
 - Competition
 - Member Demographics/Funding Concentrations
 - Pricing Lags
 - “Surge” Growth

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Key IRR Model Assumptions

- **Deposit/Share Decay Rates**
 - Account Durations (open and closed accounts)
 - Run-Off Rates (volume and balance)
 - “Surge” Deposits/Shares

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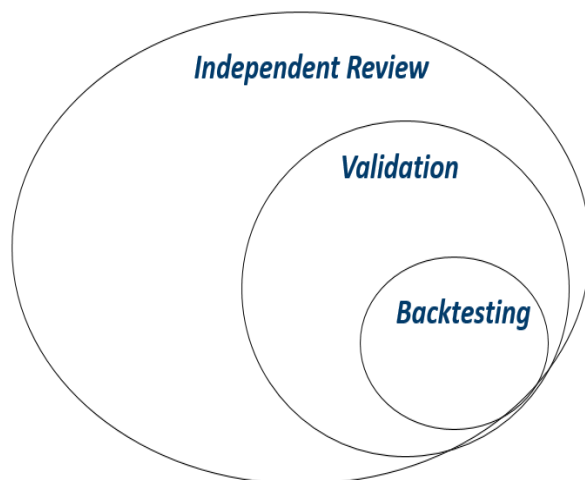
The Four Pillars

- ✓ Corporate Governance Structure
- ✓ IRR Measurements
- ✓ IRR Model Assumptions
- **Independent Review Process**

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Independent Review Program (IRR Audit)



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Independent Review Program

1. Adequacy of the internal control system
2. Appropriateness of the risk measurement system
3. Accuracy and completeness of data inputs
4. Reasonableness and validity of scenarios
5. Validity of the risk measurement calculations

*** ASSESSMENT, NOT JUST DESCRIPTION***

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Independent Review Program

Validity of risk measurement calculations

- Software/formulas/programming code
- Results and assumptions
 - Often tested by comparing actual versus forecasted results (a/k/a Backtesting)
 - Benchmarking

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Independent Review - Backtesting

- Depth depends on institution's size and complexity
- Only for earnings at risk, not capital valuation
- Should cover at least a 12-month period (not 3)
- Include both model results and key assumptions
 - Start with directional consistency of model results
 - Focus on key model assumptions (loan/deposit repricing and asset prepayments)
- Who should do it?

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The Four Pillars

- ✓ Corporate Governance Structure
- ✓ IRR Measurements
- ✓ IRR Model Assumptions
- ✓ Independent Review Process

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Plansmith's ALM Advisory Services

- Model Assumption Assessment/Development
- IRR and Liquidity (Cash Flow) Model Operation/**Outsourcing**
- Backtesting
- Sensitivity Testing
- ALM Policy & CFP Review/Development
- ALCO Assistance/Participation
- Board and/or Senior Management Training
- Capital Planning and Stress Testing

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Thank You for Attending

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